The Fourth Australasian Ground Control in Mining Conference 2018

Paper Number: 59

Managing floor heave in an underground longwall coal mine

Patrycja Sheffield and Peter Corbett

ABSTRACT

Springvale Mine is a longwall coal mine in the western coalfield of New South Wales, which encountered significant gateroad floor heave issues during retreat of LW415. Floor heave has subsequently impeded longwall advance as well as longwall bolt up and recovery to some extent during the extraction of the next five longwalls. Floor heave at Springvale develops throughout the lifecycle of the mine roadways, and is most prevalent in longwall gateroads. Floor heave has been measured as early as 2 weeks after roadway development and continues to develop through the post-development phase, with a rapid increase in close proximity to the longwall face. This paper presents a case study of the evolution of understanding of floor heave behaviour at Springvale Mine based on geotechnical characterisation, an intensive convergence monitoring program (roof and floor movement) and spatial correlation of monitored locations with longwall face position. The analysis considers previously known factors contributing to floor heave including mining depth, geological and physical properties of the rock mass and mine design geometry. Investigation results indicate a strong correlation between floor heave magnitude and roof dilation magnitude, geophysically inferred faulting in underlying strata, areas of localised stress concentration and mine roadway dimensions. The paper discussed the predictive model which was developed as a result of the study, which is now the basis of the floor heave removal program used to manage roadway convergence at the mine. Floor heave monitoring, prediction and management strategies (including floor reinforcement and removal) are also discussed.